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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/758,552 | 01/15/2004 | Jon P. Wagner | 20031231-001 | 5985 |

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| EXAMINER | |
|---|---|
| JOHNSON, CHRISTINA ANN | |
| **ART UNIT** | **PAPER NUMBER** |
| 1725 | |

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/758,552 | WAGNER ET AL. | |
| | Examiner | Art Unit | |
| | Christina Johnson | 1725 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *30 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-8,11-17,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,11-17,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-8, 11-13, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/54879 in view of Silver.

WO 00/54879 (Note that EP 1 161 991 is an English language equivalent) discloses a catalyst composition useful in water gas shift reactions for converting carbon monoxide and water into carbon dioxide and hydrogen (page 1, lines 5-10 and 25-30). The catalyst composition comprises platinum supported on a metal oxide carrier such as zirconia (page 2, line 25 – page 3, line 5). Platinum is supported in an amount in the range of 0.1-10% by weight (page 3, lines 5-8). It is taught that rhenium is supported as another active component in an amount in the range of 0.1-10% by weight (page 3, lines 5-10). In an example, a catalyst is prepared having 3% by weight Pt and 1% by weight Re, which yields a Pt/Re ratio of 3:1 (page 14, Table 3). It is further taught that the catalyst may further contain an additional metal promoter such as cerium (page 3, lines 10-18).

The WO reference teaches that the catalyst is prepared by combining the metal oxide support with aqueous salt solutions of the active metals, followed by evaporation to dryness and calcination at a temperature in the range of 400-600 degrees C (page 3,

lines 18- page 4, line 20). The use of chloroplatinic acid hexahydrate and ammonium perrhenate are exemplified as the platinum and rhenium salt solutions (Examples 1-5 and Table 2).

The difference between the reference and the claims is that the reference does not disclose the use of a support comprising cerium oxide, specifically a support comprising cerium oxide and an additive material such as zirconium dioxide.

Silver (US 6,455,182) discloses a catalyst composition useful in the catalyzing the water-gas shift reaction, converting carbon monoxide to hydrogen (column 1, lines 35-60). The catalyst composition comprises a noble metal catalyst having a promoted support, comprising a mixed oxide of at least cerium oxide and zirconium oxide (column 2, lines 55-61). Silver teaches that while cerium promoted noble metal catalysts have been shown to be effective for promoting the water gas shift reaction, they do not sufficient activity for the shift reaction without the use of a unreasonable large reactor bed (column 2, lines 15-25). Silver teaches that, through the combination of cerium and zirconia in the support material, the activity of the composition is increased and the stability of the catalyst is improved (column 2, lines 61-66). It is taught that the zirconia is present in the range of about 50-30 mole% and the ceria is present in the range of 50-70 mole % (column 4, lines 40-45). The support may further contain an additive metal such as Pr or La, in an amount in the range of 0-10 mole % (column 3, lines 1-5 and column 4, lines 44-46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the catalyst taught by the WO reference to include

the use of a mixed cerium oxide – zirconium oxide support as taught by Silver. The WO reference teaches a catalyst composition comprising Pt and Re supported on zirconia and further suggests an additional promoter such as cerium. The teachings of Silver would motivate one of ordinary skill to substitute the zirconia carrier with the mixed cerium oxide-zirconium oxide carrier in order to realize the advantages disclosed therein, i.e. higher activity and stability. Because both catalysts can be used in the same process, one would have reasonable expectation of success from the combination.

The process limitations in claim 13 is noted. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

3. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 00/54879 in view of Silver as applied to claims 1-8, 11-13, and 19-20 above, and further in view of WO 00/66486.

The teachings of WO 00/54879 as modified by Silver are applied as described above for claims 1-8, 11-13, and 19-20.

The modified disclosure of WO 00/54879 further does not teach that the primary transition metal is proved as a transition metal complex having at least one ligand, where the ligand is absent of sulfur, chlorine, sodium, bromine, and iodine.

WO 00/66486 discloses a catalyst composition useful in the conversion of carbon monoxide and water into carbon dioxide and hydrogen comprising a platinum supported on zirconium oxide (Abstract). The reference teaches that while chloroplatinic acid is an inexpensive source of platinum, tetra amine platinum nitrate (TAPN) is preferred as a source of platinum because TAPN does not introduce chlorine into the catalyst system, which would interfere with the reaction. See pages 11-12.

It would have been obvious to one having ordinary skill in the art to further modify the invention of WO '879 to include the use of TAPN in light of the teachings of WO '486. One of ordinary skill would have been motivated to do so to prevent introducing a contaminant into the catalyst system, as taught by WO '486. Because both catalysts can be used in the same reaction, one would have reasonable expectation of success from the combination.

***Response to Arguments***

Applicant's arguments filed March 30, 2005 have been fully considered but they are not persuasive.

With respect to the primary reference, applicant argues that because ceria was a known support material for platinum and rhenium water gas shift catalysts, it is reasonable to assume that the omission of ceria from the list of possible metal oxide supports in the JP reference was intentional. This argument has been considered but is not persuasive. First, throughout the entire response, it appears that applicant is arguing the references individually. However, one cannot show nonobviousness by attacking

references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Secondly, the only conclusion that one could draw from the omission of ceria from the possible support materials is that the reference does not specifically teach the use of ceria as a support material, as discussed in the previous office action. There could be a multitude of reasons why the inventor did not use ceria as a support material. This does not mean that the use of ceria would not have been obvious to one having ordinary skill in the art and is not evidence of a teaching away from a ceria support nor an indication of non-obviousness.

Applicant further argues that the JP reference teaches the addition of ceria and stresses that the use of cerium oxide in this way is not the same as the instantly claimed support material. However, the examiner does not suggest that the use of a ceria promoter is the same as a cerium oxide support material. Again, the absence of a ceria support is the difference supporting the 103 rejection. Rather, the fact that the JP reference teaches the use of a ceria promoted catalyst provides the motivation to modify the catalyst in light of the teaching by the Silver reference. As discussed above, Silver teaches that while cerium promoted noble metal catalysts have been shown to be effective for promoting the water gas shift reaction, they do not sufficient activity for the shift reaction without the use of a unreasonable large reactor bed (column 2, lines 15-25 of Silver). Silver teaches that, through the combination of cerium and zirconia in the

support material, the activity of the composition is increased and the stability of the catalyst is improved (column 2, lines 61-66 of Silver).

Applicant's arguments on page 9 of the March 30, 2005 do not appear to be relevant to the issues as hand. Again, it is the position of the examiner that the JP reference teaches the claimed invention but for the ceria support. Both references are clearly concerned with the same type of catalyst, useful in the same process and are clearly analogous art. Applicant's statement that "with respect to the noble metal catalyst, the present development is not obvious nor unpatentable over U.S. Patent 6,455,182 in view of EP 1 161 991." However, the rejection is that the claims are unpatentable over the JP reference in view of US 6,455,182, and not vice versa.

With respect to the rejection of claims 14-17 further in view of WO '486, applicant argues that WO '486 does not teach a mixture of noble metals or the use of a ceria support material. However, the reference is not relied upon to teach these features, as it is considered that they are met by the combined teachings of the JP reference and the Silver reference as discussed in detail above.

***Conclusion***

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Johnson whose telephone number is (571) 272-1176. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Johnson
Patent Examiner
Art Unit 1725
5/30/05

CAJ
May 30, 2005